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Docket No.: 1288.43131X00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:

Shinji KIMURA et al.

Serial No. 10/663,700

Filed: September 17, 2003

For: CACHE CONTROL METHOD FOR NODE APPARATUS

SUPPLEMENTAL REQUEST FOR RECONSIDERATION

June 17, 2005

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Supplemental to the Request for Reconsideration filed on April 26, 2005, in view of the meeting between Mr. Brundidge and Mr. Laufer held on June 9, 2005 clarifying issues related to the granting of Petitions to Make Special, Applicants submit the following additional remarks.

It is submitted that the cited references, whether considered alone or in combination, fail to disclose or suggest the invention as claimed. In particular, the cited references, at a minimum, fail to disclose or suggest in combination with the other limitations recited in the claims:

a first feature of the present invention as recited in independent claim 1 wherein in the storage device or the client, sending attribute information of data to the node device, the data being relayed by the node device, the attribute

information indicating as to whether or not the data is allowed to be cached in the disk device; and in the node device, judging as to whether or not the data to be relayed is allowed to be cached in the disk device, based on the attribute information; and relaying the data, which has been judged as non-cacheable, without process of the cache in the disk device;

a second feature of the present invention as recited in independent claim 3 wherein an attribute information input module that inputs attribute information of the data to be relayed, which indicates as to whether or not the data is allowed to be cached in the disk device; a judgment module that judges as to whether or not the data to be relayed is allowed to be cached in the disk device, based on the attribute information; and a cache control module that relays the data, which has been judged as non-cacheable, without process of the cache in the disk device;

a third feature of the present invention as recited in independent claim 11 wherein an attribute information management module that manages attribute information of the data, which indicates as to whether or not the data is allowed to be cached in the disk device, or whether or not the data is required to be encrypted when being written in the disk device; and an attribute information notification module that notifies the node device of the attribute information;

a fourth feature of the present invention as recited in independent claim 15 wherein a judgment that judges as to whether or not the data to be provided is allowed to be cached in the disk device, based on a predetermined condition; and a transmission control module that transmits the data, which has been

judged as cacheable, to the node device, and transmits the data, which has been judged as non-cacheable, to other computers without going through the node device; and

a fifth feature of the present invention as recited in independent claim 19 wherein means for inputting attribute information indicating as to whether or not the data to be relayed is cacheable; means for judging as to whether or not the data is cacheable, based on the attribute information; and means for relaying the data, which has been judged as non-cacheable, without process of the cache in the disk device.

To the extent applicable to the present Petition, Applicants submit that although the distinguishing feature(s) may represent a substantial portion of the claimed invention, the claimed invention including said feature(s) and their inter-operation provides a novel storage system and system and method related to or implemented in or by said storage system not taught or suggested by any of the references of record.

The references considered most closely related to the claimed invention are briefly discussed below:

U.S. Patent Publication No. 2004/0186898 A1 (Kimura et al.) discloses enhancing reading speed of data from a disk device in a computer system capable of transmission and reception of the data via node device between a client and a storage device. A share volume PDc and specific volume PDa and PDb are defined in the disk device on the storage device. Common data among respective clients and specific data corresponding to the individual client are

stored in the share volume and the specified volume, respectively. Once respective clients request virtual volumes VDa and VDb to read the data, the storage device reads out the corresponding data from the share volume or the specific volume. Kimura et al. avoids lowering the reading speed regardless of the concentration of accesses from a plurality of clients because most data can be read from the share volume. Kimura et al., at a minimum, fails to disclose or suggest sending attribute information of data to the node device, the data being relayed by the node device, the attribute information indicating as to whether or not the data is allowed to be cached in the disk device, and/or judging as to whether or not the data to be relayed is allowed to be cached in the disk device, based on the attribute information, and/or managing attribute information of the data, which indicates as to whether or not the data is required to be encrypted when being written in the disk device, and/or judging as to whether or not the data to be provided is allowed to be cached in the disk device, based on a predetermined condition. More particularly, Kimura et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 3, the above described third feature of the present invention as recited in independent claim 11, the above described fourth feature of the present invention as recited in independent claim 15 and the above described fifth feature as recited in independent claim 19, in combination with the other limitations recited in each of the independent claims.

U.S. Patent Publication No. 2003/0009640 A1 (Arimilli et al.) discloses a non-uniform memory access (NUMA) data processing system includes a plurality of nodes coupled to a node interconnect. The plurality of nodes contain a plurality of processing units and at least one system memory having a table (e.g., a page table) resident therein. The table includes at least one entry for translating a group of non-physical addresses that individually specifies control information pertaining to the group of non-physical addresses for each of the plurality of nodes. The control information may include a plurality of write through indicators that are each associated with a plurality of write through indicators that are each associated with a respective one of the plurality of nodes. When a write through indicator is set, processing units in the associated write node write modified data back to system memory in a home node rather than caching the data. The control information may further include a data storage control field comprising a plurality of non-cacheable indicators that are each associated with a respective one of the plurality of nodes. When a non-cacheable indicator is set, processing units in the associated node are instructed to not cache data associated with non-physical addresses within the group translated by reference to the table entry. The control information may also include coherency control information that individually indicates for each node whether or not inter-node coherency for data associated with the table entry will be maintained with software support. Arimilli et al., at a minimum, fails to disclose or suggest sending attribute information of data to the node device, the data being relayed by the node device, the attribute information indicating as to whether or not the

data is allowed to be cached in the disk device, and/or judging as to whether or not the data to be relayed is allowed to be cached in the disk device, based on the attribute information, and/or managing attribute information of the data, which indicates as to whether or not the data is required to be encrypted when being written in the disk device, and/or judging as to whether or not the data to be provided is allowed to be cached in the disk device, based on a predetermined condition. More particularly, Arimilli et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 3, the above described third feature of the present invention as recited in independent claim 11, the above described fourth feature of the present invention as recited in independent claim 15 and the above described fifth feature as recited in independent claim 19, in combination with the other limitations recited in each of the independent claims.

U.S. Patent Publication No. 2004/0123068 A1 (Hashimoto) discloses a system and method for reducing an overhead of storing a log of each host processor in a cluster system that includes a plurality of host processors. Part of a disk cache of a disk system shared by the plurality of host processors is used as a log storage area. In order to make this possible, the disk system is provided with an interface enabled to be referred and updated from each of the host processors separately from an ordinary I/O interface. A storage processor controls an area of the disk cache used for ordinary I/O processes by means of a disk cache control table, and a storage processor controls a log area allocated in

the disk cache by means of an exported segments control table. The disk cache area registered in the exported segments control table is mapped into the virtual address space of the main processor by an I/O processor. Each host processor, when accessing a disk drive, issues an I/O command. When accessing the log area, however, the host processor specifies a mapped virtual address and access the log area. Each storage processor distinguishes between an I/O command an access to the log area to input/output data. Hashimoto, at a minimum, fails to disclose or suggest sending attribute information of data to the node device, the data being relayed by the node device, the attribute information indicating as to whether or not the data is allowed to be cached in the disk device, and/or judging as to whether or not the data to be relayed is allowed to be cached in the disk device, based on the attribute information, and/or managing attribute information of the data, which indicates as to whether or not the data is required to be encrypted when being written in the disk device, and/or judging as to whether or not the data to be provided is allowed to be cached in the disk device, based on a predetermined condition. More particularly, Hashimoto et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 3, the above described third feature of the present invention as recited in independent claim 11, the above described fourth feature of the present invention as recited in independent claim 15 and the above described fifth feature as recited in

independent claim 19, in combination with the other limitations recited in each of the independent claims.

Therefore, since the cited references fail to disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 3, the above described third feature of the present invention as recited in independent claim 11, the above described fourth feature of the present invention as recited in independent claim 15 and the above described fifth feature as recited in independent claim 19, in combination with the other limitations recited in each of the independent claims, it is submitted that all of the claims are patentable over the cited references whether said references are taken individually or in combination with each other.

In view of the foregoing, Applicant requests that this Petition to Make Special be granted and that the application undergo the accelerated examination procedure set forth in MPEP 708.02 VIII.

Respectfully submitted,

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